Monkeypox Detection in the Western Hemisphere, 2003

The Wisconsin Perspective

Interagency cooperation is NOT optional!
Tracing the introduction of Monkeypox: African rodents and prairie dogs

Ghana to TX
50 Gambian rats (GR)
53 rope squirrels (RS)
2 brush-tailed porcupines (BTP)
47 sun squirrels (SS)
100 striped mice (SM)
~510 dormice (DM)

April, 2003
Tracing the introduction of Monkeypox: African rodents and prairie dogs
Iowa to IL
Gambian rats
dormice

Innocent bystander

Gambian rats comingled with prairie dogs in IL
Tracing the introduction of Monkeypox:
African rodents and prairie dogs

- Gambian rats
- Prairie dogs
- 4/15 & 5/3
Prairie Dogs as Pets?

What could possibly go wrong?
Initial Report – May 24, 2003

- 3.5 y.o. ♀ hospitalized 5/22 - cellulitis & febrile illness post prairie dog bite
- Ill prairie dog taken to vet clinic, died, enlarged LN to private vet dx lab for culture
- Gram negative rod growing in bacterial culture of LN
- Child treated empirically with doxycycline & ciprofloxacin
Primary inoculation site, Marshfield index case, 5/26/03
Hospital day 4, 13 days following prairie dog bite
Marshfield index case, 5/26/03 disseminated lesions

Image Courtesy of Marshfield Clinic, Marshfield, WI
SE Wisconsin patient 1 - Primary Lesion

Image Courtesy of Medical College of Wisconsin, Milwaukee, WI
Monkeypox Timeline

5/11—Two Pdogs purchased as a Mother’s Day present at “swap meet” in Wausau
5/13—Pdog bites 3 y.o. on hand
5/16—Febrile illness in 3 y.o. with apparent cellulitis
5/20—Pdog dies; enlarged submandibular LN to private vet dx lab for culture.
5/22—Patient hospitalized
5/24—DPH notified. Gram neg. bacillus growing out of Pdog LN culture; tularemia suspected
5/26—Patient’s mother has onset of “rash” and chills; lesion biopsied. Tularemia & plague ruled out in child.
Monkeypox Timeline (cont)

- Local Health Depts: St. Paul lab visualizes poxvirus-like inclusions in EM of mother's biopsy samples
- Index child's father develops prodrome of febrile vesicular illness in SE WI in adult male who sold Pdogs at swap meet
- USDA & WI Dept. of Ag notified
- DPH notified mother's EM & virus culture was forwarded to hospital lab.
- CDC poxvirus lab contacted by DPH regarding specimen submission.
- DPH notified local health depts
- CDC-Milwaukee HD informed by Milwaukee HD of case of orthopoxvirus ID in adult male
- DPH notified of tentative orthopoxvirus ID in mother's EM and virus culture by hospital lab.

DCP: DPH
CDC: CDC
USDA: USDA
WI Dept. Ag: WI Dept. Ag
Private Med Clinics: Private Med Clinics
Local Health Depts: Local Health Depts
Div. of Public Health: Div. of Public Health
Electron Microscopy

Image Courtesy of Marshfield Clinic, Marshfield, WI
6/5 - Additional cases in SE WI suspected

6/6 - DPH issues emergency order banning import, sale, transport, or display of Pdogs and animals in contact with Pdogs received after 4/1.
   - CDC team visits Froedtert Hospital in Milwaukee

6/7 - PCR confirmation of monkeypox-like virus by CDC

6/9 - WI Dept of Ag issues emergency order similar to DPH & imposes quarantines on individual animals.

6/11 - CDC and FDA issue national order prohibiting Pdog movement.
Response Activities

- Emergency orders for animal quarantines
- Infection control guidelines for HCWs treating ill persons
- Home isolation of human case-patients
- Serologically monitor pet store employees and veterinary staff (no asymptomatic seroconversions)
- Human case finding / active surveillance
Human Case Finding

- Multiple means of communication
  - Health Alert Network, WI DPH website
  - E-mails to providers, ICPs, local health depts
  - Regular conference calls with local health depts
  - Mass media releases → self-reporting urged

- Active surveillance of high risk groups via sx diaries or periodic phone interviews
  - Laboratorians working with cases’ samples
  - Household/close contacts
  - HCWs caring for Mpox patients
  - Staff at vet clinics
  - Pet store employees/visitors
Surveillance Diaries &
Active Phone Surveillance of Contacts

- 21 days
- Temperature
- Rash
- 9 other symptoms
- Immediate report fever and rash
- Submitted weekly
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<th>Cases</th>
<th>Field trips</th>
<th>HCW / med lab</th>
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Patient Questionnaire

- Adapted smallpox instrument
- Signs and symptoms
- Rash specifics
- Exposure hx
- Vaccine hx
- Medical hx
Wisconsin Human Case Schematic (n=27)

- **Human case**
- **Human case with exposure to “Chewey”**
- **Pr.dog ownership**
- **Pr.dog exposure only**

1. **SE WI Distributor**
   - HH B: (Lost to Follow-up)
   - HH C
   - Pet Store A: patron
   - Pet Store B
   - Vet Clinic A
   - Vet Clinic B: (No cases)
   - HH D
   - HH E: patron
   - HH F: patron
   - HH G: patron
   - HH H
   - HH I: patron
   - HH J

2. **Illinois Distributor**
   - Household A: (No Cases)
Veterinary Surveillance

Part 1 – Surveillance by private vet. clinicians

• Case definition with clinical & epi criteria developed by CDC, DPH, Dept. Ag

• Infection control precautions for vet clinics developed by WI Dept. Ag

• Vets to report suspected cases by phone to Dept. Ag

• Standardized questionnaire to be administered

• Any human illness in HHS to be reported to DPH

• Consultation available for necropsy submissions, specimen collection (not to be done at private vet clinics), disposal of bedding/waste

• IC precautions, request for reporting definition emailed to vets via WI Vet Med. Assoc.
Veterinary Surveillance (cont)

Part of other animals on premises where infected animals were housed

- Serum samples collected from owned pets by Dept. of Ag veterinarians
  - Serology done by CDC: one asymptomatic dog weakly positive on generic orthopox serology

- Animals housed in proximity to Pdogs at pet stores purchased by DPH, euthanized & tested for orthopox by PCR & VC by WI State Lab. All negative.
Part 3: Sylvatic animal testing – could Mpox virus now be established in native rodent populations?

- Trapping studies around premises where known infected animals had been housed
- Rodents, insectivores, and lagamorphs trapped, necrosied, and tested
- Trapping done by USDA/APHIS Wildlife Services staff using precautions as for hantavirus surveys
- Necropsies & testing performed at USGS National Wildlife Health Ctr
Monitoring of Animals under Quarantine

- No monitored animals developed illness
- None of the animals housed in proximity to the infected Pdogs (in pet shops & private homes) were positive on lab testing except one weakly seropositive dog
- Quarantine lifted after 6 weeks for animals other than Pdogs (none became ill)
- Most prairie dogs euthanized; otherwise quarantined permanently
Public Health Lessons Learned

- Sometimes, when you hear hoofbeats, they really are zebras
- Bioterrorism preparedness really is dual use
- More regulation needed at state and federal level regarding import, export and movement of exotics
- Development / promulgation of IC guidelines to protect veterinary staff is needed
Public Health Lessons Learned

• Communicate regularly with your state & federal agriculture officials, state VMA, vet diagnosticians, and wildlife agencies
  – Define roles in emergencies
  – Understand their capacities and capabilities
  – Serve on interagency committees, common projects

✓ Working together preferable to a “get acquainted” meeting
“POWERPOINT POISONING.

GAARRRRH!